



Volvo Bus. Driving quality of life

VOLVO B5LHC

Listen to your city



The Volvo B5LHC

will make your city a better place. The first thing you notice is that it's silent, and, in the absence of engine noise, you can listen to the true sounds of your city. What would it tell you? Perhaps a little bit about how a new generation of public transportation can make the city grow, prosper and better serve its citizens.

The Volvo B5LHC is silent. It's also cleaner and it's for real. Already today Volvo can help cities to take the first steps on a new path, where the available funding is used more efficiently and where you can achieve a breakthrough towards sustainability.



• The B5LHC shares the same conductive opportunity
• charging system used on the 7900E and 7900EH
• products giving flexibility and interoperability for
• operators and local authorities.

A NEW DAY

is dawning

Fuel efficiency

The additional battery capacity of the B5LHC enables the fuel consumption to be reduced considerably compared to standard hybrid, with the ability to recover more energy from braking.

Environmental performance

The B5LHC environmental and energy consumption benefits can help to reduce operational costs for the operator and health costs for the local authority. If carbon neutral energy is used, energy consumption can be reduced by up to 60% and CO₂ can be reduced by up to 75%.

Into the comfort zone

Many modern cities have high demands in terms of emissions, noise and speed, and many cities are implementing low emission and safety zones. Volvo Zone Management allows the remote control of the B5LHC to meet these demands.



True uptime

Volvo's hybrid technology has been given a top ranking in uptime by operators and PTAs throughout Europe. The B5LHC shares this technology, proven in operation by thousands of buses.

Silent comfort

For one 3-6 minute charge, the B5LHC can run in full electric mode for up to 7km. This makes for an extremely silent and comfortable passenger experience and also improves the experience of passengers and residents along the route.

The future is here and now

Electromobility is the way to sustainable transport solutions. Volvo can ensure you are safely guided through the technology change.

Flexibility in operation

The B5LHC offers outstanding performance in demanding city centre operations whilst also giving greater flexibility and operating range, enabling longer routes to be operated as an efficient hybrid vehicle. Charging is fully automated and takes between 3 to 6 minutes. Conductive opportunity charging allows vehicles to operate continuously throughout the day for periods up to 24 hours, increasing productivity.

The driver in charge

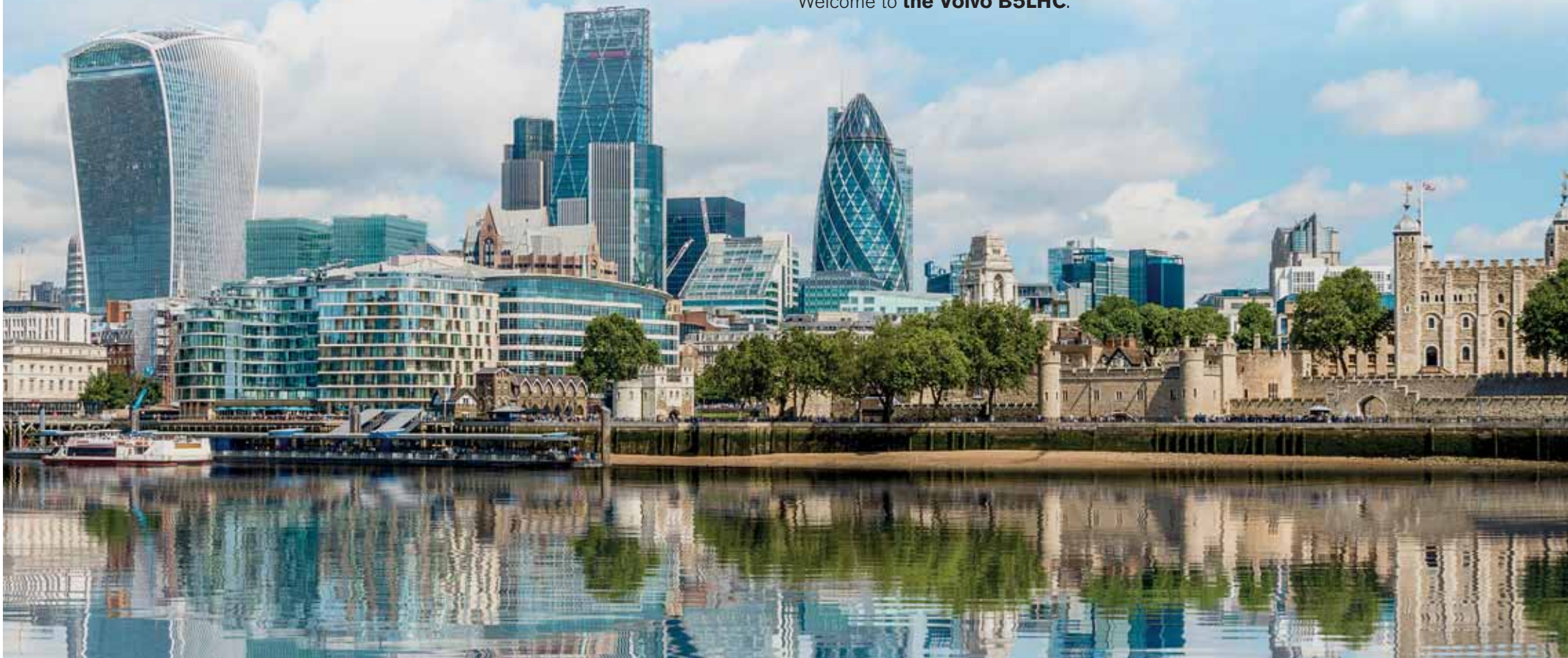
Driving a Volvo B5LHC is just as smooth as with any other Volvo. Charging is fully automatic, and so is the hybrid power management. Add to that it is one of the best driver environments available, with world-class ergonomics.

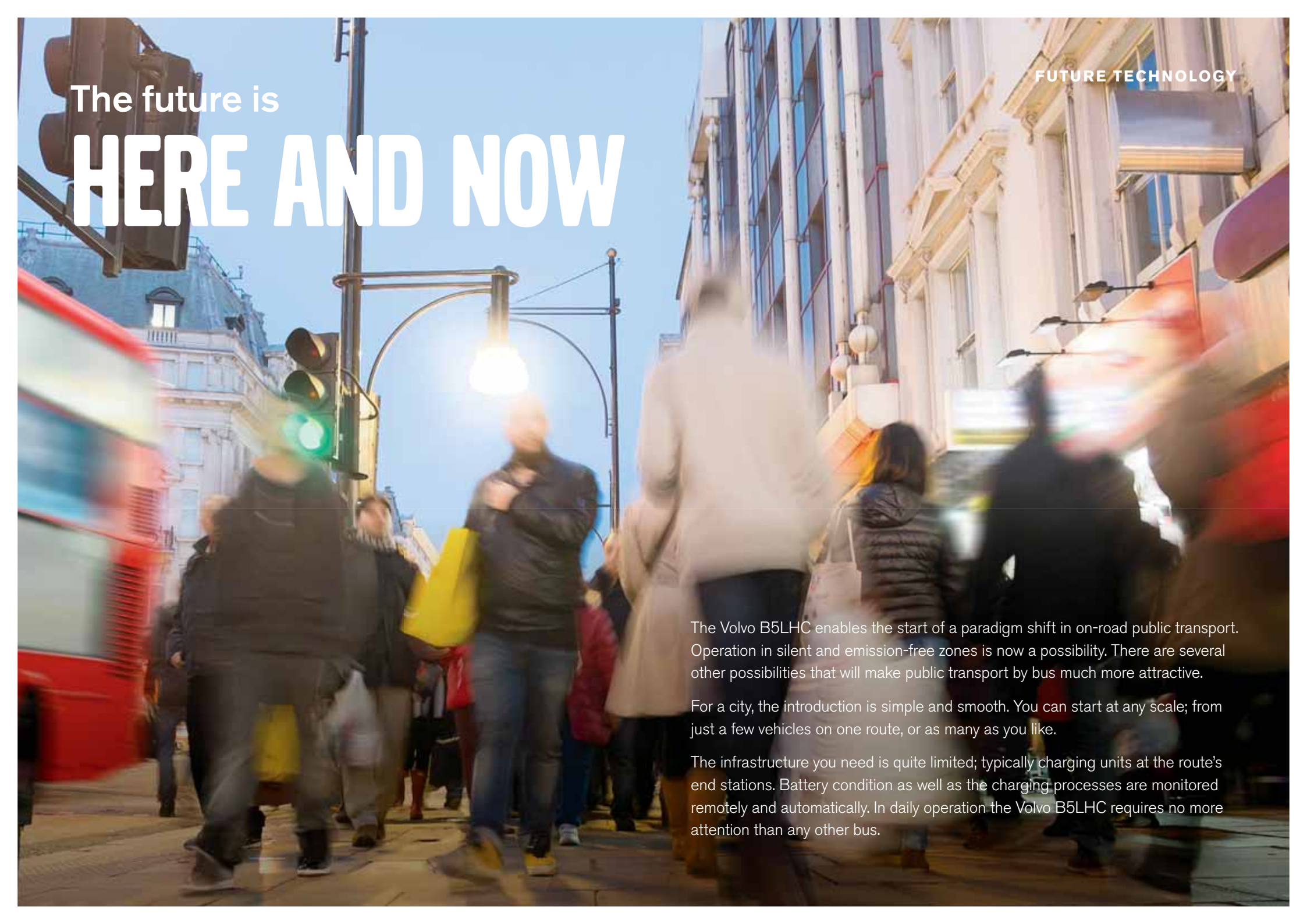
The urban CHALLENGE

Cities of today are facing several challenges, and sometimes the demands seem contradictory. On the one hand there is a need for increased public transport capacity, and on the other, there is a real requirement for reduced environmental impact – in terms of both exhaust emissions and noise.

Offering the Volvo B5LHC sends a clear message to cities all over the world; capacity and environmental care are no longer mutually contradictory. Any city can start building a transport system that generates silence, helps improve public health and saves masses of energy.

Any city can start the migration into the World of Green Efficiency. Welcome to **the Volvo B5LHC**.





The future is

HERE AND NOW

FUTURE TECHNOLOGY

The Volvo B5LHC enables the start of a paradigm shift in on-road public transport. Operation in silent and emission-free zones is now a possibility. There are several other possibilities that will make public transport by bus much more attractive.

For a city, the introduction is simple and smooth. You can start at any scale; from just a few vehicles on one route, or as many as you like.

The infrastructure you need is quite limited; typically charging units at the route's end stations. Battery condition as well as the charging processes are monitored remotely and automatically. In daily operation the Volvo B5LHC requires no more attention than any other bus.



Standing by you

ALL THE WAY

Volvo's hybrids are well-proven and top-ranked in commercial operation, yet the technology of electric hybrids as such may be new to many cities.

With our support and guidance, you can introduce Volvo Electric Hybrids with complete peace of mind. There's no need to wait. Implementation can be done in increments route by route. And since the buses are hybrids, they can be put into operation even before completing the charging infrastructure.

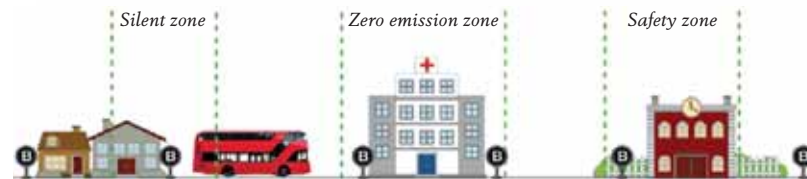
ENVIRONMENTAL PERFORMANCE

SILENT

clean and safe

The B5LHC can operate for up to 7km in full electric mode giving silent emission free operations. This means less noise and cleaner air along the route and at terminals and bus stops. The diesel engine will assist only when required, charging the battery as well. Just like Volvo's other hybrids, the Volvo B5LHC also charges the battery by recovering energy when braking and when going downhill.

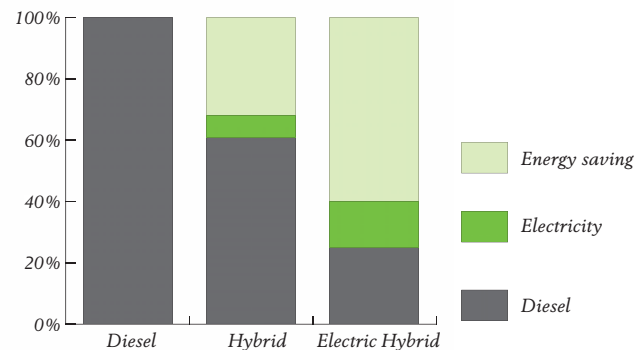
In cities with restrictions, the Zone Management function helps the driver comply with these rules. The driver gets a reminder when approaching a restricted zone, and it is even possible to enforce electric drive inside such zones.



- ⋮ Zone Management is a service enabling compliance with
- ⋮ restrictions in various kinds of sensitive areas.

SAVE

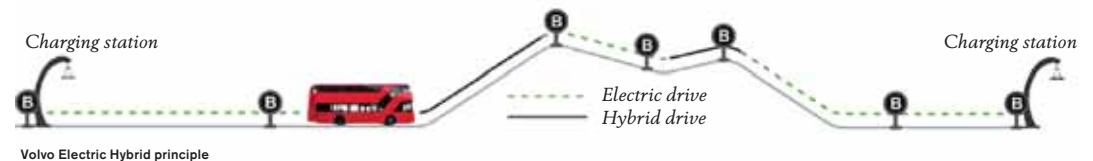
on your energy cost



With hybrid technology, much of the vehicle's dynamic energy can be recovered when braking or going downhill. The result is that masses of diesel fuel can be replaced by a small amount of electric energy. The total energy savings are shown in the diagram. The diesel reference is based on data reported as yearly average for a European route of 10 km, average speed 18 km/h, with 6 min charging at each terminus.

Volvo's Electric Hybrid driveline saves an average of 75% of the diesel fuel in operation, compared to a regular diesel bus. CO₂, NO_x and particulate emissions are reduced in proportion. But what about the electricity?

There must be a cost, monetary and environmental, for the energy replacing the 75% of diesel fuel. The simple answer is – yes. The diesel saved is replaced by electricity from brake energy recuperation and charging, and since running a bus on electricity is far more efficient, the cost and the total energy consumption are substantially lower. The total energy saving, electricity included, is substantially reduced and the environmental cost is lowered by a similar amount.



ENERGY EFFICIENCY

Charging for SUCCESS

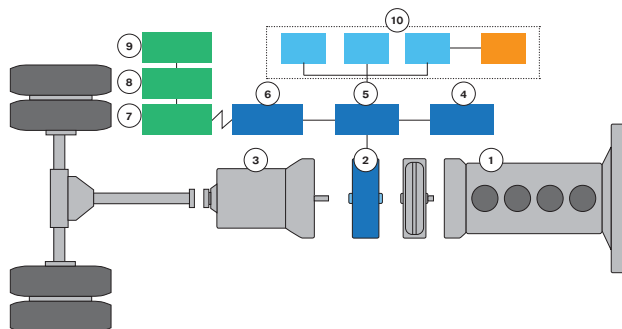
The Volvo Electric Hybrid Driveline is an extension of the well-proven driveline used in the Volvo 7900 Hybrid. The difference lies in a more powerful electric motor, increased energy storage and equipment for opportunity charging. This typically permits electric drive up to 7 km between chargings or 70% of a route.

The Volvo Conductive opportunity charging system provides fully automated charging of the battery or electrical storage system in the Volvo B5LHC. The infrastructure creates new opportunities for urban planning, allowing - for instance - the design of indoor bus terminus. The charging system can be integrated into any part of the city; each charging system supplied includes the complete interface between the power network, the energy supplier, the equipment and the vehicle.

The charging system uses a pantograph which makes a physical contact with the bus from above. This optimises charging efficiency and provides the ability to safely charge whilst passengers embark and disembark. All moving parts are integrated into the charging system, while the contact rails on the bus are fixed-mount connectors. This minimises the need for additional maintenance on the vehicle and reduces vehicle weight, which increases passenger capacity and vehicle efficiency.

The main components of the Volvo Electric Hybrid system

1. Diesel engine
2. Electric motor/generator (I-SAM)
3. Gearbox
4. ESS (Electrical Storage System)
5. Power electronics
6. Charging interface onboard
7. Charging interface offboard
8. Power Charger
9. Grid
10. Electrified auxiliaries



The main prerequisites for charging electrically powered vehicles are safety, reliability, short charging times and ease of operation. Volvo Opportunity Charging System delivers on all these criteria, thus ensuring uptime and energy efficiency.

UPTIME

Performance in the LONG RUN

The Volvo B5LHC shares the technology of the well-proven Volvo 7900 Hybrid. Volvo's parallel hybrid technology presents an outstanding track record. Experiences from operators in many major cities show clearly that the hybrids' uptime and availability is second to none. And in some cases the Volvo hybrids out perform all other buses.

With rapid and efficient charging, typically six minutes at end stops, the Volvo B5LHC will keep your schedules unaffected.

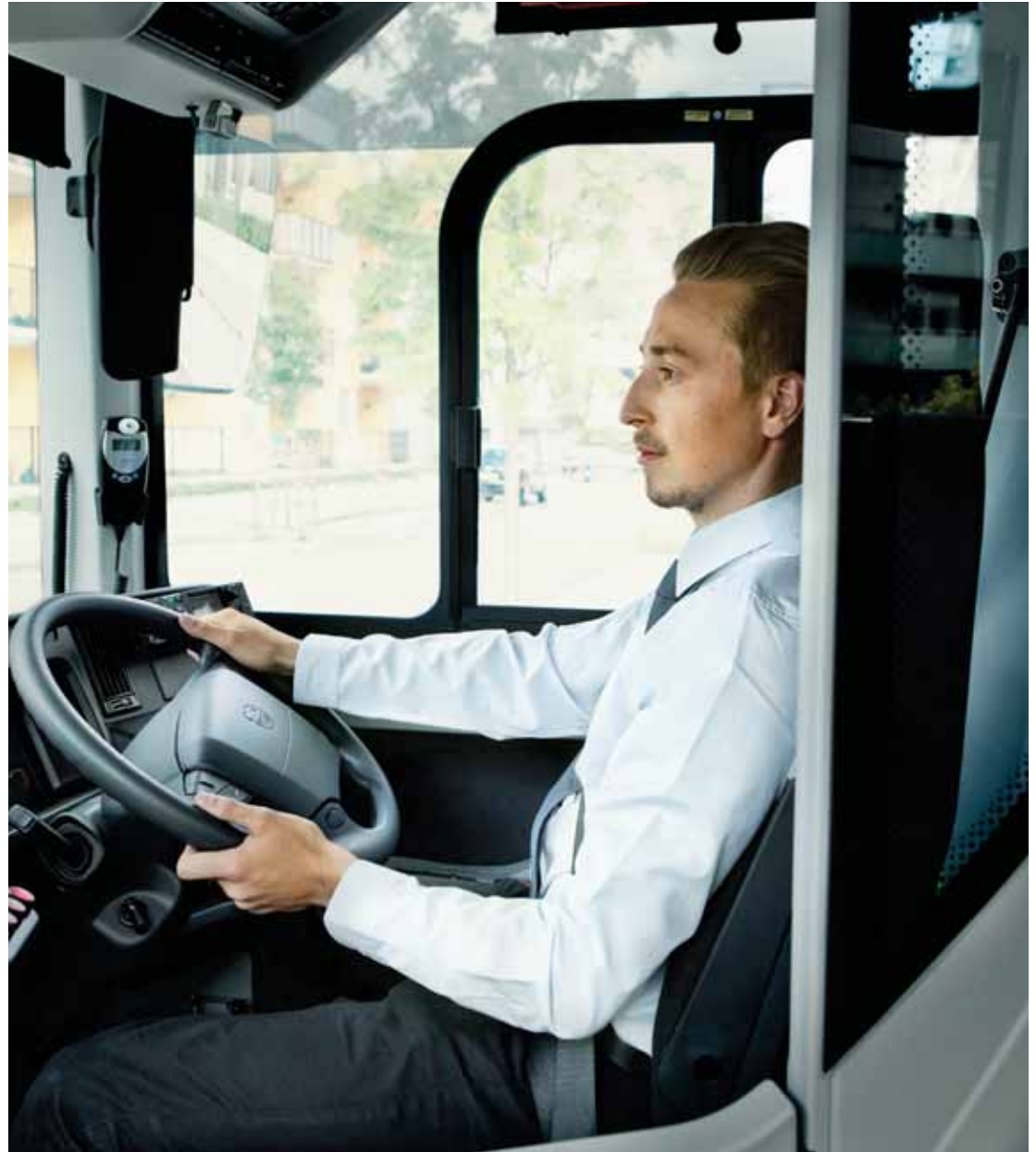
VOLVO BUS

DRIVER PERFORMANCE

The driver is IN CHARGE

Driving the Volvo B5LHC is effortless and uncomplicated. The procedure at charging stations is fully automated and the driver doesn't even need to push a button. Just stop in the right position, apply the handbrake and the charging process starts. Charging time is only six minutes, so your schedule is safe.

The driver's environment is probably one of the best available, with world-class ergonomics and superior visibility. Moreover, the Volvo B5LHC offers great comfort due to silent and smooth drive when in electric mode. There's no doubt – this bus is designed around the driver.



Designed around the driver. The adjustable dashboard features easy to read instruments and controls located within convenient reach. The instrument cluster displays only relevant information, minimising distraction and helping the driver stay focused and alert.

FLEXIBLE IN OPERATION

Living the CITY LIFE

The Volvo B5LHC is outstanding when it comes to energy efficiency, low noise and exhaust emissions. But it also offers great flexibility. It can run in pure electric mode in restricted areas for up to 7km. And since it is a hybrid, it can be put into traffic on any city route, unlike other alternatives such as overnight-charge buses, trams and trolley buses. The hybrid driveline allows detours and replacement of other buses even where there is no access to charging equipment. That's how the Volvo B5LHC provides enhanced opportunities and flexibility in traffic planning and when managing your fleet.

The Volvo B5LHC opens for new possibilities. The city can offer public transport in sensitive areas, such as low speed, silent and zero-emission zones close to schools, hospitals and residential quarters.



Welcome ON BOARD

The Volvo B5LHC welcomes your passengers silently and gently. Electric drive is not only free from engine noise; it also offers a smooth and comfortable ride. On board the Volvo B5LHC the passengers meet an efficient layout, comfortable seats and a bright and roomy ambience. Wide doors, electrically powered, make for swift and easy boarding and exit. And the low noise makes it easier to talk to others, listen to music or simply enjoy the ride.

Silent. Silence is a relief. It enables conversation and when listening to music, you can lower the volume – and the stress level. Your passengers will definitely appreciate it.



Comfortable. Ergonomic, comfortable seats and a smart layout make every ride in the Volvo B5LHC a pleasure.

BUSINESS IN PARTNERSHIP

A perfect MATCH

We offer an extensive service portfolio, giving you freedom of choice when creating your perfect set-up. All services are designed to respond to the main concerns of your operation.



Vehicle Management

Moving towards 100% uptime at minimum cost.



Fleet Management

Cost reduction based on detailed and aggregated information on vehicle usage.



Parts Supply

Ensures the availability of Genuine Volvo Parts and right-sizing of your spare parts stock.



Service Contracts

Give the desired level of assurance against unplanned stops and costs, at a fixed monthly rate.



Traffic Management

Supports vehicles dispatch, operation monitoring and regulation of all the services, as well as driver and passenger information.



Zone Management

Manages zones and secures compliance with traffic restrictions.



Hybrid Battery Contracts

No worries about the need for battery condition or capacity.



Financing

Gives the operator a financial partner who really understands the customer's business.



Tried. Tested.

TRUSTED

The Volvo B5LHC is an extension of the Volvo 7900 offer. It is well-proven in field trials and the technology inside has been in commercial operation for many years in our previous hybrid models.

Volvo offers a unique combination of environmental performance, energy efficiency and reliability. Ultimately this will make public transport more attractive, by serving passengers better and by using tax money in a more responsible way.



Gothenburg

The Volvo 7900 Electric Hybrid has been in traffic on one of the most demanding routes in the city of Gothenburg. Steep climbs and very busy traffic. The verdict is clear. Passengers appreciate the low noise, the smooth ride and the environmental performance. Residents along the route note a distinct reduction in disturbance and the operator's staff appreciate the environmental effects as well as the silent and comfortable working environment.



Edinburgh

Leading Scottish operator Lothian has operated Volvo hybrids since early 2013. Both the public and their drivers are very positive in their view of the buses. Lothian even registered a 10% increase in passengers on the routes operated by hybrids, so the appreciation definitely is for real. After evaluation of the ten first Volvo 7900 Hybrids, Lothian ordered 40 more. They also plan for, and look forward to, the imminent introduction of electric hybrids.

⋮ See the film at youtube.com/VolvoBuses

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RENOWNED VOLVO SAFETY

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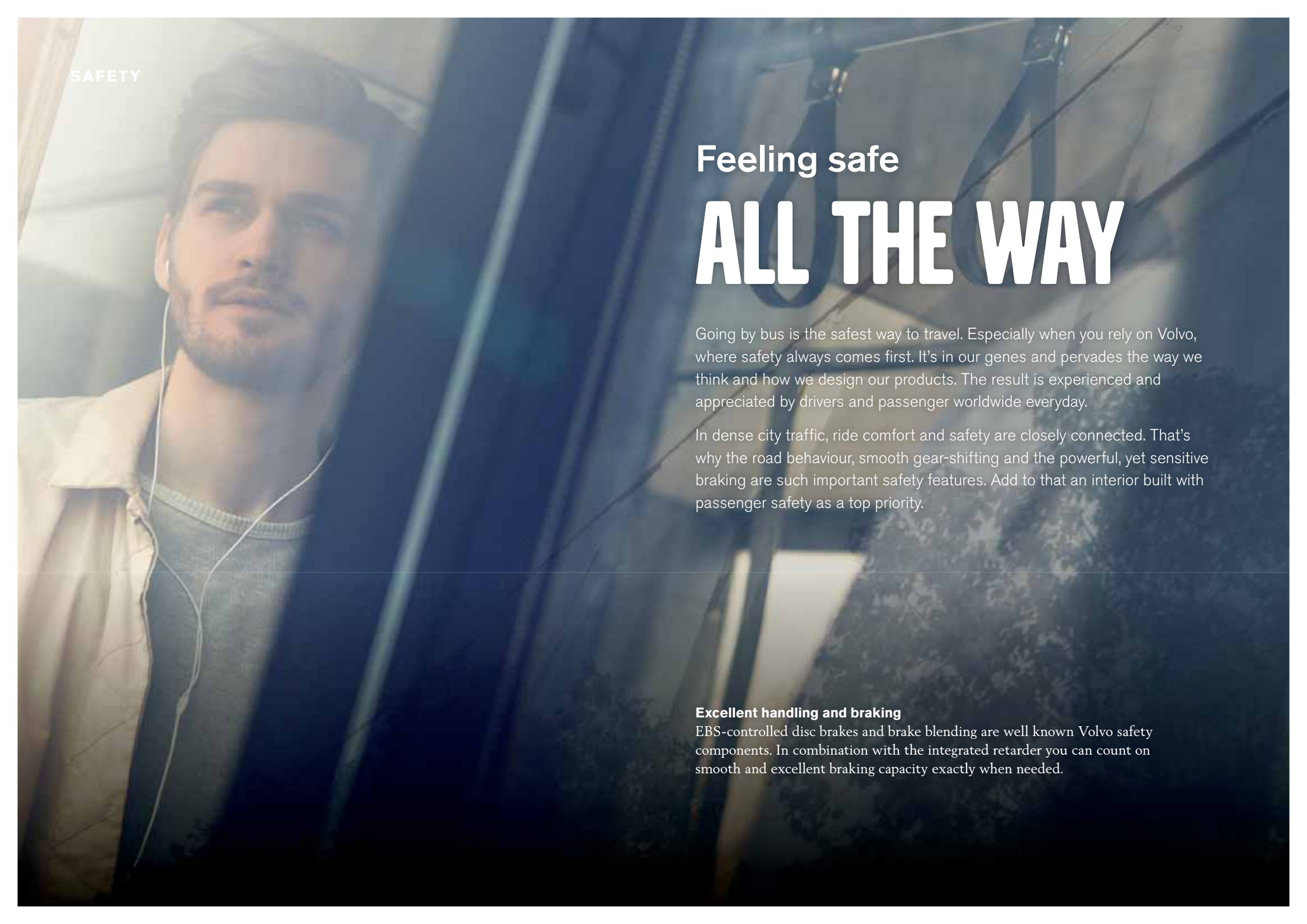
OUR VISION IS CLEAR: ZERO ACCIDENTS WITH VOLVO GROUP PRODUCTS

At Volvo safety is a primary concern

Always. That's why we continuously go beyond legislation and introduce safety features long before, sometimes decades before, they become a legal demand. We do it because we can and because it offers a higher level of safety. If it can be done it should be done, and we know that your passengers will appreciate the consideration you show by choosing Volvo.

A responsibility in society

For us, safety is so much more than just developing innovative safety solutions in our products. We also have a responsibility in society and an important role to play when it comes to making road traffic safer. This goes far beyond just ensuring superior safety for drivers and passengers, it also encompasses the safety of other road users. And we know we can make a difference. Volvo Group is one of the world's largest companies in terms of safety research for commercial vehicles.

A man with a beard and earphones is looking out a bus window. The background shows a blurred city street with trees and buildings. The text is overlaid on the right side of the image.

SAFETY

Feeling safe

ALL THE WAY

Going by bus is the safest way to travel. Especially when you rely on Volvo, where safety always comes first. It's in our genes and pervades the way we think and how we design our products. The result is experienced and appreciated by drivers and passenger worldwide everyday.

In dense city traffic, ride comfort and safety are closely connected. That's why the road behaviour, smooth gear-shifting and the powerful, yet sensitive braking are such important safety features. Add to that an interior built with passenger safety as a top priority.

Excellent handling and braking

EBS-controlled disc brakes and brake blending are well known Volvo safety components. In combination with the integrated retarder you can count on smooth and excellent braking capacity exactly when needed.



Volvo B5LHC

FACTS AND FIGURES

Dimensions and weights

Length [m]	10.6
Width [m]	2.55
Height [m]	4.5
Permitted GVW [kg]	19 000

Powertrain - electric hybrid system

Configuration	
Emission standard	Euro 6
Diesel engine	Volvo D5K 240, 4-cylinder, in-line diesel engine with common rail injection
Output [hp]	240
Torque [Nm]	918
Electric motor	Volvo I-SAM
Power output, max [kW]	150
Torque, max [Nm]	1200
Energy storage system	High capacity Lithium-Ion battery
Transmission	Volvo I-Shift automated gear-changing system

Charging system

Opportunity charging.

Fully automatic fast charging sequence.

Rapid charge time: up to 6 min.

Axles, suspension and steering

Front axle	Volvo RFS-Low beam axle
Rear axle	Portal, double reduction axle, with optimised ratio
Suspension	Electronically controlled air suspension with kneeling function
Power steering	Electrically powered hydraulic steering
Tyres	275/70R 22.5"
Rims	Steel rims available

Brakes

Volvo electronically controlled disc brakes (EBS).
Brake Blending function (all). The electric motor functions as a retarder and recovers braking energy.

Driver's environment

Spacious driver's environment with wide range of individual adjustment possibilities.

Volvo dashboard meets EBSF and VDV demands.

Swivelling driver seat.

Passenger capacity

No. of passengers	87
No. of seats, max	43 top deck, 17 bottom deck
Type of seats	Volvo City bus seats available in several variants, optimised for easy cleaning and maintenance.

Doors and door system

Door system	Electric
Door layout	2+2+0

Climate system

Zones	Separate climate zones for driver and passengers
Ventilation and heating	Powerful ventilation, roof heating units
AC max [kW]	28



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VOLVO

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